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In general the leafy hepatics can be distinguished from the mosses by the flattened appearance of the plant, due to a marked differentiation of the upper (dorsal) and the lower (ventral) surface. The leaves also are apparently arranged in two rows overlapping like shingles (imbricated). An exception to this is Gymnomitrium before mentioned. The leaves of hepatics consist of a single layer of almost regularly hexagonal cells, without even the rudiment of a mid-rib (except in one or two rare forms), and they are often bifid or multifid.

If in fruit, the leafy hepatics can easily be recognized by the dark, globular, four-valved capsule borne on a slender, delicate, white fruitstalk and having spiral elaters mixed with the spores.

The true mosses, on the other hand, possess stem and leaves arranged in ranks and while often flattened have a much less marked dorso-ventral differentiation. The leaves are never bifid or multifid and the leaf-cells are usually much elongated, seldom regularly hexagonal and in three-fourths of the species possess well-defined mid-rib.

No moss except the rare *Andreæa* has a capsule splitting into four valves but nearly all moss capsules open by a lid (*operculum*), and most have a characteristic fringe of teeth (*peristome*) about the mouth. No true moss has spiral elaters mixed with its spores. In color, mosses, excepting the peat mosses, are nearly all of some shade of green ranging from almost black to a light yellow green.

Any good text-book of botany will give these distinctions with more detail and usually with helpful illustrations.

THE CORD MOSS AND ITS ALLIES.

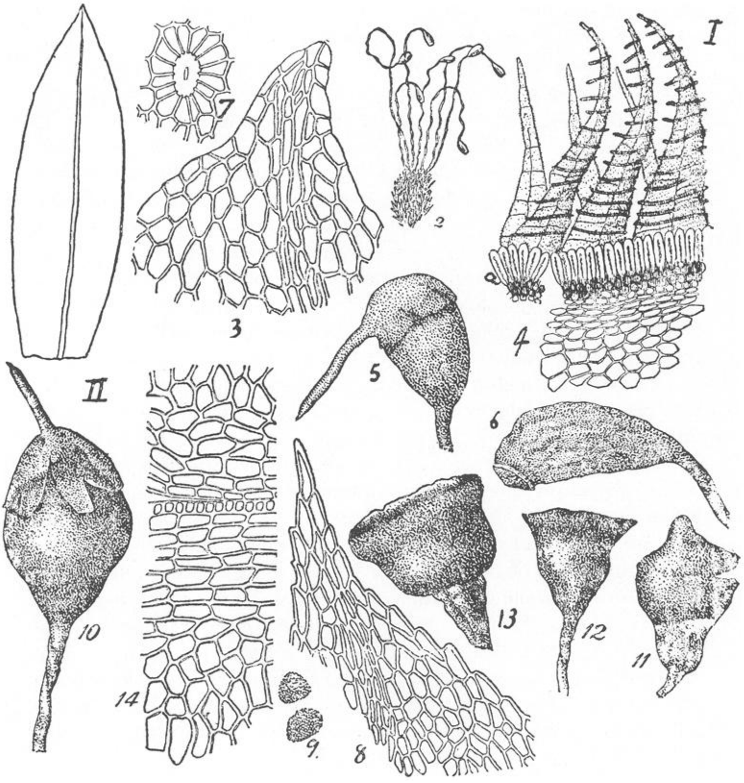
THERE are several common and interesting allies of the Dicranums that would make profitable study, but for variety's sake we will turn our attention to a moss with a double peristome and other characters not before treated of in THE BRYOLOGIST.

The cord moss (*Funaria hygrometrica*) is so called because of the twisted seta which is very hygroscopic and untwists when moist. Its Latin name, *Funaria*, is derived from *funis*, a rope. This twisting of the seta is not peculiar to this group, however, but is common in many other groups. The cord moss is to be found everywhere, being especially abundant in waste places and on soil recently burned over. I have seen it completely cover the soil in an old strawberry bed. When mature it is easily recognized by the peculiar looking curved capsule, with its mouth on one side (Figs. 5 and 6). When immature it is much harder to recognize because the capsule is erect and nearly symmetric and the calyptra has not assumed the rakish position indicated in figure 5.

This moss has perhaps been given a more careful study than any other species, and it is the one described in nearly all our textbooks. There are several other species in the United States, but only this one is likely to be met with by our readers. So characteristic is the appearance of the mature plant that we will give no detailed description, but will refer briefly to the characters not before explained. When the lid is removed there will be seen at the base of the peristome around the outer rim of the urn, two or three rows of peculiar vesicular (bladder-like), thin-walled cells, forming the annulus (Fig. 4*a*). If the operculum has already fallen, the annulus will be gone also. It is said to be deciduous. In some species it remains attached to the mouth of the urn and is said to be persistent. The annulus is very highly elastic, and when the capsule is fully ripe it helps throw off the operculum. The peristome consists of sixteen undivided, colored, articulate teeth, and inside of these another row of sixteen thin, light-colored teeth, known as the endostome, each tooth being called a segment or process. In *Funaria* the segments are entirely separate and are opposite the teeth. If the teeth be viewed in profile a sharp projection (appendage) will be seen extending inwards from each articulation. The articulations mark the boundary between the cells and the appendage, the thickened wall separating the two cells. These appendages are well shown in Fig. 4.

The spores ripen early in June, and there is not a member of the Chapter who cannot easily collect an abundance of fresh material for study.

The Urn Moss (*Physcomitrium turbinatum* (Mx.) Brid.)—*P. pyriforme* of Lesquereux and James' Manual) is undoubtedly very closely related to *Funaria*. The figures show us that the leaf structure of one species resembles the other but to the beginner it will seem strange to classify a moss with no peristome at all as the near relative of one with a double peristome. Yet this arrangement is accepted by pretty nearly everybody who has studied the two carefully, and there are several other similar cases. For some unexplained reason the urn moss seems to have lost its peri-



(The figures below the line I represent *Funaria hygrometrica;* those below the line II, *Physcomitrium turbinatum.*)

I. 1, Outline of leaf; 2, deoperculate plants; 3, apex of leaf, showing costa ending below apex; 4, a portion of the mouth of the capsule after the operculum has fallen, showing annulus and peristome; 7, stoma from base of capsule. II. 8, Apex of leaf, showing costa terminating below the leaf-apex; 9, spores; 10–13, capsules in various stages; 14, a section of the mouth of capsule and operculum, showing annulus and transversely elongated cells at the mouth of capsule.

[Taken from Mrs. Britton's *Observer* articles, by permission.]

stome. There are several species of *Physcomitrium* in the United States, but *P. turbinatum* is by far the most frequent and will be readily recognized from the figures. It is common in old fields, open grassy places and the like. It is very small and will be easily overlooked. It, also, comes to maturity in June.

Mrs. Britton has given these two species a much fuller treatment in *The Observer*, and has written a monograph of the species of *Physcomitrium* which appears in the *Bulletin of the Torrey Botanical Club* for May, 1894.

The beginner may perhaps confuse species of *Pottia* with the urn mosses, especially *P. truncatula*. In this last species, however, the costa is excurrent, passing out of the apex of the leaf into a short point. The costa is percurrent or excurrent in nearly all of our species of *Pottia*, and in most the leaf cells are papillose. The Pottias, moreover, mature their capsules in winter.

MOSSES FOR DISTRIBUTION.

THE Splachnaceæ are of our queerest and most interesting mosses. They are usually found growing on decaying animal matter or nitrogen-containing animal excreta. They are furthermore remarkable for the extreme development of the apophysis which never occupies less than half of the capsule and in some species of Splachnum is so greatly enlarged as to become umbrella-shaped, reminding the writer of the hood of a cobra. There are a large number of stomata in the outer wall of the apophysis and a large amount of assimilative tissue within, which goes to show that this grotesque outgrowth is another of Nature's devices to provide nourishment for her lowly children.

For a stamped self-addressed envelope, the following mosses will be sent to members of the Moss Chapter only: Mrs. Britton will send *Tetraplodon bryoides*, an alpine member of this group; Mr. A. A. Eaton will send *Splachnum ampullaceum;* Mr. J. Warren Huntington will send *Buxbaumia aphylla*, which was mentioned in a previous article; Mrs. Emilia C. Anthony will send "the white moss" (*Leucobryum glaucum*), which grows in conspicuous whitish cushions in woods throughout our range. This moss is a near relative of the Dicranums as its peristome will show and it is also remarkable in having its leaves of more than one layer of cells. It is thought by many botanists that these leaves represent the greatly expanded costa, from which the lamina has entirely disappeared. This will not seem improbable to those who have studied the leaves of the long-leaved Dicranum.

The Cambridge Botanical Supply Co., of Cambridge, Mass., will send *Brachythecium asperrimum*, Mitt.

For five cents in stamps A. J. Grout will send *Funaria hygrometrica* and *Physcomitrium turbinatum*.

The above specimens are all fertile. Hereafter when sterile specimens are offered, *st.* will be placed after their names. For addresses, see list of members.